

## Host Fruit Odours as Attractants for *Bactrocera cucurbitae* Females

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**Background:** The Melon fly, *Bactrocera cucurbitae* (Diptera, Tephritidae), is one of the most important pests attacking Cucurbitaceae crops in tropical regions of the world such as Reunion Island. In Reunion Island it is specialized on this family of plants. As fruit volatiles are critical in host finding behaviour of females, cucurbit fruit volatiles can be considered as a promising source of new attractants. The aim of our study was to investigate in various species (18) of this family, the volatile composition of fruit emission and to identify which components could be attractive for females of *B. cucurbitae*.

**Methods:** In a first step, we evaluated in small test cages the relative attractiveness for the females of the odours of various host fruit species within the Cucurbitaceae family. In a second step, the volatile emissions of the fruits were characterized according to their stage of ripening using Headspace Solid-Phase MicroExtraction (HS-SPME) collection and Gas Chromatography/Mass Spectrometry (GC/MS) detection. Finally, a series of volatile compounds were selected according to the chemical analysis and to Gas Chromatography Electroantennogram Detection (GC-EAD), which were tested individually or in blends in olfactometer tests.

**Results:** In small test cages, large differences in attractiveness were observed between the cucurbit species, and, for a given species, between varieties and between phenological stages. The higher response of the females was observed with mature fruits of *Luffa cylindrica* (sponge gourd) and *Cucumis sativus* (cucumber). Depending on the cucurbit species, the most attractive odour was the odour of young fruit or the odour of mature fruit. Ten volatile compounds (alcohols, aldehydes and a terpene) inducing GC-EAD responses were selected and tested in olfactometer bioassays. The attractiveness of single compounds for *B. cucurbitae* females varied according to their dose. Three of the tested blends induced female responses similar to the odor of fresh cucumber (around 60% of response).

**Conclusion:** The most promising blends found in our study should be further tested in the future for their attractiveness in field experiments.

**Key words:** Cucurbit volatiles, HS-SPME, GC-EAD, olfactometer, kairomones